

1 **CLAIMS:**

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3 1. A method for efficient transmission of TCP/IP headers via a wireless  
4 communications link from a sender to a receiver, the method comprising:

5 obtaining TCP/IP packets having associated TCP/IP headers;

6 losslessly compressing the associated headers;

7 feedback-independently transmitting of a plurality of the compressed  
8 headers via the communications link;

9 the transmitting comprising:

10 adjusting a sliding window within which the plurality of the  
11 compressed headers are transmitted, wherein the adjusting is modeled to  
12 react to TCP/IP window-size changes that results from the congestion  
13 procedures of TCP/IP;

14 using the sliding window, W-LSB encoding the plurality of the  
15 compressed headers;

16 sending the resulting W-LSB encoded plurality of compressed  
17 headers.

18  
19 2. A method as recited in claim 1, further comprising inferentially  
20 determining whether there is an inconsistent context between the sender and the  
21 receiver.

1           3.     A method as recited in claim 1, further comprising:  
2           inferentially determining whether there is an inconsistent context between  
3           the sender and the receiver;

4           if so, then refreshing the context between the sender and the receiver.  
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6           4.     A method as recited in claim 1, wherein the sender is a header  
7           compressor (HC) and the receiver is a header decompressor (HD).  
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9           5.     A computer comprising one or more computer-readable media  
10          having computer-executable instructions that, when executed by the computer,  
11          perform the method as recited in claim 1.  
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13          6.     A computer network comprising a computer comprising one or more  
14          computer-readable media having computer-executable instructions that, when  
15          executed by the computer, perform the method as recited in claim 1.  
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17          7.     A computer-readable medium having computer-executable  
18          instructions that, when executed by a computer, performs the method as recited in  
19          claim 1.  
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1           **8.**     A method for efficient transmission of network transport-layer  
2 protocol headers via a communications link, the method comprising:

3           obtaining transport-layer protocol packets having associated transport-layer  
4 protocol headers;

5           compressing the associated headers;

6           feedback-independently transmitting of a plurality of the compressed  
7 headers via the communications link.

8  
9           **9.**     A method as recited in claim 8, further comprising inferentially  
10 determining whether there is an inconsistent context, wherein an inconsistent  
11 context is when one or more headers are not properly received by a receiver on the  
12 communications link.

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14           **10.**    A method as recited in claim 8, further comprising:  
15           inferentially determining whether there is an inconsistent context, wherein  
16 an inconsistent context is when one or more headers are not properly received by a  
17 receiver on the communications link;

18           if so, then refreshing the context to make the context consistent.

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20           **11.**    A method as recited in claim 8, wherein, for the compressing, the  
21 headers are compressed losslessly.  
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1           **12.**    A method as recited in claim 8, wherein the transmitting comprises:  
2           adjusting a sliding window within which the plurality of the compressed  
3 headers are transmitted;  
4           using the sliding window, W-LSB encoding the plurality of the compressed  
5 headers;  
6           sending the resulting W-LSB encoded plurality of compressed headers.

7  
8           **13.**    A method as recited in claim 8, wherein the transmitting comprises:  
9           adjusting a sliding window within which the plurality of the compressed  
10 headers are transmitted, wherein the adjusting is modeled to react to window size  
11 changes of the transport-layer protocol that results from the congestion procedures  
12 of such transport-layer protocol;  
13           using the sliding window, W-LSB encoding the plurality of the compressed  
14 headers;  
15           sending the resulting W-LSB encoded plurality of compressed headers.

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17           **14.**    A method as recited in claim 8, wherein the communications link is  
18 wireless.

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20           **15.**    A method as recited in claim 8, wherein the network transport-layer  
21 protocol is TCP.  
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1       **16.** A computer comprising one or more computer-readable media  
2 having computer-executable instructions that, when executed by the computer,  
3 perform the method as recited in claim 8.

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5       **17.** A computer network comprising a computer comprising one or more  
6 computer-readable media having computer-executable instructions that, when  
7 executed by the computer, perform the method as recited in claim 8.

8  
9       **18.** A computer-readable medium having computer-executable  
10 instructions that, when executed by a computer, performs the method as recited in  
11 claim 8.

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13       **19.** A method for efficient transmission of network transport-layer  
14 protocol headers via a communications link, the method comprising:  
15       transmitting a plurality of compressed transport-layer protocol headers via  
16 the communications link;  
17       inferentially synchronizing.

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19       **20.** A method as recited in claim 19 further comprising:  
20       obtaining transport-layer protocol packets having associated transport-layer  
21 protocol headers;  
22       compressing the associated headers.

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1           **21.** A method as recited in claim 20, wherein, for the compressing, the  
2 headers are compressed losslessly.

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4           **22.** A method as recited in claim 19, wherein the synchronizing  
5 comprises modeling the encoding upon a congestion procedure of the network  
6 transport-layer protocol.

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8           **23.** A method as recited in claim 19, wherein the synchronizing  
9 comprises modeling the size of a sliding window to react to window size changes  
10 of the transport-layer protocol that results from congestion procedures of such  
11 transport-layer protocol.

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13           **24.** A method as recited in claim 19 further comprising inferentially  
14 determining whether there is an inconsistent context, wherein an inconsistent  
15 context is when one or more headers are not properly received by a receiver on the  
16 communications link.

1        **25.**    A method as recited in claim 19 further comprising:

2            inferentially determining whether there is an inconsistent context, wherein  
3            an inconsistent context is when one or more headers are not properly received by a  
4            receiver on the communications link;

5            if so, then refreshing the context to make the context consistent.

6  
7        **26.**    A method as recited in claim 19, wherein the transmitting comprises:

8            adjusting a sliding window within which the plurality of the compressed  
9            headers are transmitted;

10           using the sliding window, W-LSB encoding the plurality of the compressed  
11           headers;

12           sending the resulting W-LSB encoded plurality of compressed headers.

1       **27.**    A method as recited in claim 19, wherein  
2       the transmitting comprises:

3               adjusting a sliding window within which the plurality of the  
4       compressed headers are transmitted;

5               using the sliding window, W-LSB encoding the plurality of the  
6       compressed headers;

7               sending the resulting W-LSB encoded plurality of compressed  
8       headers;

9       the inferential synchronizing comprises modeling the size of the sliding  
10      window to react to window size changes of the transport-layer protocol that results  
11      from the congestion procedures of such transport-layer protocol.

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13       **28.**    A method as recited in claim 19, wherein the communications link is  
14      wireless.

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16       **29.**    A method as recited in claim 19, wherein the network transport-layer  
17      protocol is TCP.

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19       **30.**    A computer comprising one or more computer-readable media  
20      having computer-executable instructions that, when executed by the computer,  
21      perform the method as recited in claim 19.



1           **31.**    A computer network comprising a computer comprising one or more  
2 computer-readable media having computer-executable instructions that, when  
3 executed by the computer, perform the method as recited in claim 19.

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5           **32.**    A computer-readable medium having computer-executable  
6 instructions that, when executed by a computer, performs the method as recited in  
7 claim 19.

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9           **33.**    A method for efficient transmission of network transport-layer  
10 protocol headers via a communications link, the method comprising:

11           encoding a plurality of compressed transport-layer protocol headers;

12           transmitting the plurality of compressed headers via the communications  
13 link within a transmission;

14           inferentially synchronizing such transmission by modeling the encoding  
15 upon a congestion procedure of the network transport-layer protocol.

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17           **34.**    A method as recited in claim 33 further comprising:

18           obtaining transport-layer protocol packets having associated transport-layer  
19 protocol headers;

20           losslessly compressing the associated headers.  
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1       **35.**    A method as recited in claim 33, wherein:

2       the encoding comprises:

3               adjusting a sliding window within which the plurality of the  
4       compressed headers are transmitted;

5               using the sliding window, W-LSB encoding the plurality of the  
6       compressed headers.

7  
8       **36.**    A method as recited in claim 33, wherein:

9       the encoding comprises:

10              adjusting a sliding window within which the plurality of the  
11       compressed headers are transmitted;

12              using the sliding window, W-LSB encoding the plurality of the  
13       compressed headers;

14       the transmitting comprises sending the resulting W-LSB encoded plurality  
15       of compressed headers.

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17       **37.**    A method as recited in claim 33, wherein the communications link is  
18       wireless.

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20       **38.**    A method as recited in claim 33, wherein the network transport-layer  
21       protocol is TCP.

1           **39.** A computer-readable medium having computer-executable  
2 instructions that, when executed by a computer, performs the method as recited in  
3 claim 33.

4  
5           **40.** A method for efficient transmission of network transport-layer  
6 protocol headers via a communications link, the method comprising:

7           transmitting a plurality of compressed transport-layer protocol headers via  
8 the communications link;

9           inferentially determining whether there is an inconsistent context, wherein  
10 an inconsistent context is when one or more headers are not properly received by a  
11 receiver on the communications link;

12           if so, then refreshing the context to make the context consistent.

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14           **41.** A method as recited in claim 40, wherein the communications link is  
15 wireless.

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17           **42.** A method as recited in claim 40, wherein the network transport-layer  
18 protocol is TCP.

19  
20           **43.** A computer-readable medium having computer-executable  
21 instructions that, when executed by a computer, performs the method as recited in  
22 claim 40.  
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1       **44.**    A transmission system comprising:  
2       a transmitter configured to transmit a plurality of compressed transport-  
3 layer protocol headers via a communications link to a receiver;  
4       an inferential synchronizer.

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6       **45.**    A system as recited in claim 44, wherein the inferential synchronizer  
7 is configured to inferentially determine whether there is an inconsistent context,  
8 wherein an inconsistent context is when headers are not properly received by a  
9 receiver on the communications link and if so, then refresh the context to make the  
10 context consistent.

11  
12       **46.**    A system as recited in claim 44, wherein the inferential synchronizer  
13 is configured to model the size of a sliding window to react to window size  
14 changes of the transport-layer protocol that results from congestion procedures of  
15 such transport-layer protocol.

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17       **47.**    A network computing system comprising a system as recited in  
18 claim 44 and a receiver.

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20       **48.**    A system as recited in claim 44, wherein the communications link is  
21 wireless.

1           **49.** A system for efficient transmission of network transport-layer protocol  
2 headers via a communications link, the system comprising:

3           a memory comprising a set of computer program instructions; and  
4           a processor coupled to the memory, the processor being configured to  
5 execute the computer program instructions, which comprise:

6                   obtaining transport-layer protocol packets having associated  
7 transport-layer protocol headers;

8                   compressing the associated headers;

9                   feedback-independently transmitting of a plurality of the compressed  
10 headers via the communications link.

11  
12           **50.** A system as recited in claim 49, wherein the processor is further  
13 configured to execute the computer program instructions, which comprises  
14 inferentially determining whether there is an inconsistent context, wherein an  
15 inconsistent context is when one or more headers are not properly received by a  
16 receiver on the communications link.